ATOMIC ENERGY Letter

THE FIRST AND ONLY

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Dear Sir:

Premier Malenkov's assertion last week that the Soviet Union has mastered the production of the hydrogen, or fusion bomb was considered more an indication of Soviet progress in this field, rather than a true statement of fact, by informed individuals in the nuclear weapons program in the United States. It is believed that substantial progress has been made by the Soviet both in the physics of the reaction, and in the actual mechanics of a hydrogen device. However, it is only until a test explosion has been made that it is possible to confirm this proper application of theory and practice. Since it is not believed that the Soviet has as yet made a test explosion of a hydrogen bomb, Premier Malenkov's statement is therefore deemed both premature and overly optimistic. Lewis L. Strauss, chairman, U. S. Atomic Energy Commission, said in Washington that the Commission never assumed it was beyond the capabilities of the Russians to produce such a weapon. He stated that, because of this, the Commission, more than three years ago, pressed forward with this development. (Mr. Strauss referred to the USAEC's Savannah River Plant, the $2.5 billion facility to produce tritium and other essentials for a hydrogen bomb. DuPont, prime contractor on this job, already has some of the supporting facilities there in operation, preparing materials for start-up of the first major production units at that site.)

A nuclear power plant, which can be used in an isolated high cost power area, is the subject of a design study now under way at Walter Kidde Nuclear Laboratories, Inc., Long Island. The firm has received a USAEC contract for the investigation; work will be concentrated on the study of a 30,000-kw. plant, to produce power only. Under the terms of the contract, the study is to be completed late this year. It is to include detailed analyses of architect-engineer costs, and construction costs, as well as operating costs, for a four year period following the start up of the plant.

The keel of the second nuclear powered submarine--the Sea Wolf--will be laid this September, at the Groton, Conn. yards of the Electric Boat Division of General Dynamics Corp., the Navy has now revealed. The nuclear power plant for this submarine (submarine intermediate reactor) will be the work of the people at Knolls Atomic Power Laboratory, West Milton, N.Y., the General Electric-operated unit. (Electric Boat has for some time been engaged in construction of the Nautilus, the first nuclear powered undersea craft, power plant for which is a joint project of Westinghouse Electric, and Argonne National Laboratory.) (Last week Congress approved a new military appropriation to cover work at Knolls; some $968,000 will permit special military projects there to be continued.)

A degree in nuclear and industrial engineering will now be granted by Kansas State College, Manhattan, Kansas, starting with the coming college term. The curriculum in nuclear engineering combines fundamentals of atomic energy and radio-tracer techniques with basic engineering courses in mechanics, unit operations, thermodynamics, and design.

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BUSINESS NEWS...in the nuclear energy field...

PATENT SETTLEMENT MADE: A $300,000 payment has now been made by the U. S. Government to settle a claim made by G. M. Giannini & Co., Inc. for use by the USAEC, and its predecessor Manhattan District, of a patent assigned to Giannini. The U. S. patent, entitled "Process for the Production of Radioactive Substances", was owned jointly by the seven physicists who developed it in Rome, prior to 1934, and the Giannini Co., each of whom receives one-eighth of the award. The physicists involved are Bruno Pontecorvo, who disappeared in September, 1950, after flying to Finland from England, and who is believed to be in the Soviet Union; Edoardo Amaldi, Istituto fisico della Universita, Rome; Franco Rasetti, Johns Hopkins University, Baltimore; Emilio Segre, Berkeley, Calif.; Guilio Cesare Trabacchi, and Oscar d'Agostino, both of Instituto di Sanita Pubblica, Rome and Enrico Fermi. The discovery involved in the patent was that radioactive isotopes of a number of elements can be produced by exposing the elements to neutrons which have been slowed down by passage through a moderating material. This principle has been applied in the atomic energy program. The patent, granted in 1940, was partially revoked by the Atomic Energy Act of 1946 which provides that "just compensation" shall be made for such revocation. The settlement gives the U. S. Government, as represented by the USAEC, complete and unqualified ownership of the patent.

CALL STRIKE AT OAK RIDGE: The first major strike at atomic energy plants at Oak Ridge, Tenn., occurred in the last fortnight when some 3,500 workers affiliated with the AFL struck for a wage increase of 10½¢ an hour at two of the three plants there. Carbide and Carbon Chemicals Co., a division of Union Carbide, which operates the plants as prime contractor for the USAEC (on a cost-plus-fixed-fee basis) had offered a 5¢ increase, which was unacceptable to the union. Not affected is K-25, uranium-235 producer plant, there.

SUIT FILED FOR INJURIES FROM RADIOACTIVE MATERIALS: Claiming that he became totally disabled through working with uranium and other radioactive materials, one Erroll J. Dubois, a machinist at Los Alamos Scientific Laboratory, has brought suit for $200,000, against the regents of the University of Calif., operating-contractors of the Laboratory. In the suit, filed in state district court at Santa Fe, Mr. Dubois states that the university failed to install safety devices. The university has replied that the disability incurred was due to Mr. Dubois' own negligence; further, that the suit should have been brought under the provisions of the Workman's Compensation Act.

NEW REPRESENTATIVES APPOINTED: Two firms in the nuclear field, through recently appointed representatives, are now broadening their distribution base. One of these firms, Atomic Instrument Co., Cambridge, Mass., has appointed Rudolph Grave A/B, Stockholm, Sweden, to handle sales in Norway and Sweden, and Eastern Electric & Engineering Co., Bombay, India, to represent Atomic in that country, through four sales offices.....The other firm, Detectolab, Inc., Chicago 26, Ill., has recently concluded an agreement with American Hospital Supply Corp., and the Scientific Products Division, under which these companies will handle all of Detectolab's nuclear equipment for the hospital and clinical laboratory field. The agreement, which is on an exclusive basis, now puts the Detectolab line into the hands of the 375 technical salesman of American Hospital and Scientific Products.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Current list of literature references on radioisotope applications in medicine and research. This listing, of value to medical research workers, includes such groupings as bacteria and viruses, brain tumor localization, thyroid, cholesterol and fat metabolism, and others. Complete listing for 1952 consisted of 414 references; it is available for $2. References for 1953 will be furnished for $5 for the year; mailings are made every 4-months.-- Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.

Home Shelters For Family Protection in an Atomic Attack. Includes working drawings and simplified illustrations, showing the householder how to construct such a shelter. 86 pages. --Superintendent of Documents, Washington 25, D.C. (30¢)

Industrial Research and the Atomic Future. Addresses given at the 57th annual Congress of American Industry Dec., 1952. 39 pages.-- National Association of Manufacturers, 14 W. 49th St., New York 20.

NEW PRODUCTS, PROCESSES & SERVICES...in the nuclear field...

FROM THE MANUFACTURERS: Scintillation well counter, Model DS-3, is a new instrument recommended by the manufacturer where extremely efficient counting of gamma-emitting samples is desired. Sensitivity of the instrument is said to be such that activities as low as 0.00001 microcurie can be assayed. This will make it useful, the manufacturer states, for determination of blood volume, protein bound iodine (PBI), red blood cell mass, urinary iodine, and in many other low level activity determinations. For sample volumes less than about 2 ml., the instrument is insensitive to the sample volume. Gamma emitting samples are prepared in standard test tubes, or centrifuge tubes, and then inserted directly into the well of the crystal. Over-all efficiencies of 43% for gammas from Cobalt-60, and 51% for gammas from Iodine-131, are said to be obtained when the unit is used with this manufacturer's scaler.--Nuclear Instrument & Chemical Corp., Chicago 10, Ill.

INSTRUMENT APPLICATIONS: A paper scanning device incorporating a beta gauge, and developed by Tracerlab, Inc., Boston nuclear instrument manufacturer, for Southland Paper Mills, Inc., Lufkin, Texas, is said to be so sensitive that a recorder trace of two successive scannings of the same strip of newsprint can be superimposed. Instead of scanning across the moving sheet as it is being produced, the Beta Gauge Strip Scanner measures a profile of a 220-inch paper strip taken straight across the sheet. This provides measurement of web variations, enabling corrections in operating methods to be made so that a more uniform sheet may be produced. Previous methods of scanning across the moving sheet had introduced unwanted variables.

NEW INSTRUMENT DEVELOPMENT: A new drill-hole logging unit, said to be lighter, more portable, more versatile, and cheaper to build than similar instruments, used for the detection and evaluation of uranium beneath the earth's surface, has been designed and fabricated by USAEC people of the Instruments Branch of the USAEC's New York Operations office. Field tests have indicated "very satisfactory performance", and the USAEC's Dr. Phillip L. Merritt, who is in charge of exploration, said that USAEC survey teams will be equipped with the units as soon as they are available. The entire instrument weighs less than 100-pounds (complete with 2000-ft. of cable), is 20x12x12-inches in size, and requires less than one-half the electrical energy used by an automobile radio for complete operation, including electric drive for the cable reel. The instrument is said to have the capacity and sensitivity of earlier, more bulky equipment which required truck mounting, and high powered electric generators for operation. (Normally, cores removed from drill holes must be assayed to determine the amount of uranium present. With this instrument, however, the amount of radioactivity, and the depth at which it is located, are automatically recorded above the ground, as the probe is lowered down the drill hole. Measurements can be taken at the rate of one foot or ten feet per minute.) The logging unit has been designed to use either a scintillation counter or a Geiger counter, depending on the size of the drill hole.

RADIOISOTOPE NEWS: In what is said to be the first such application of iridium-192, the radioisotope was used by Isotope Products, Houston, Tex., to look for hydrogen blisters in the steel of a refinery unit. Film sheets were first taped around a steel tank of the Eastern States Petroleum Co. Then, some 76,000 millicuries of iridium-192 were loaded into a camera and lowered into the 5½-ft. diameter tank. After proper exposure, the developed films showed the location of the blisters.

Radioactive products produced in Britain's nuclear reactors were recently shown and offered to prospective users at the International Congress of Radiology, held in Copenhagen, July 20-25. The products fell into three main groups: chemical compounds containing radioisotopes, the so-called "tagged" compounds; gamma-ray sources for radiotherapy and industrial radiography; and beta ray sources for medical and industrial uses. Included among these products, which are processed by the Radiochemical Center, at Amersham, after they are produced in the Harwell or other reactors, was a complete range of amino acids, uniformly labelled with carbon-14 at high specific activity; they are prepared by biological synthesis. The Radiochemical Center has also developed a series of metallic products in the form of foils, plates, and wires, which incorporate a radioactive isotope. Of interest is the fission product strontium-90, which is now being produced in substantial quantities at Amersham in the form of foils or plaques. It was recommended by scientific staff from Harwell and Amersham, on hand at the Congress, as providing an excellent source of high energy beta radiation for medical and industrial uses.

THE UNITED STATES' ATOMIC ENERGY PROGRAM, January-July, 1953. A digest prepared for readers of this Newsletter from the USAEC's 14th semi-annual report.

NEW PLANT CONSTRUCTION: During the first half of 1953, costs incurred for the overall plant and equipment program of the USAEC averaged about $92 million per month. This was approximately 5% of the total expenditures for new construction in the United States. On Jan. 1st, of this year, the capital investment in atomic energy plant, in the United States, was about $4 billion. Some $3.5 billion is currently available to the USAEC for new construction. In 1954, USAEC construction will be 5% of U. S. total.

Small Business Program: The USAEC has an established small business program operating in conjunction with its procurement activities; small business received direct contract awards of $36.1 million, or 2.2% of the $1.6 billion total dollar value of USAEC contracts awarded from July 1, 1951-March 31, 1953. Sub-contracts awarded to small business firms, by prime contractors, during this period, amounted to $225.6 million, or 43.3% of the whole.

Construction Progress: Several production facilities were completed during this period and successfully operated. This has resulted in more fissionable materials being produced in the first 6-months of this year than in any comparable period. Among these completed facilities are part of the gaseous plant at Paducah, Ky., which is now in operation. At Hanford Plutonium Works, in Washington, a new reactor and a chemical processing plant have contributed to plutonium production. And at the Savannah River Plant, some of the supporting facilities are already in operation, preparing materials for start-up of the first major production units at that site. Only a few units are still under construction at the Feed Materials Production Center, Fernald, Ohio; the plant there is essentially completed. Additional electrical power, for these new plants, is being furnished by such new units as TVA's Shawnee, Ky., steam plant, where the first electric generator unit began commercial operation April 9, 1953, and the Joppa plant of Electric Energy, Inc., where test operation of the first unit was resumed late in June after the completion of certain design modifications.

ATOMIC WEAPONS: At the rate presently authorized, and facilitated by adequate supplies of fissionable materials (as above), the production of atomic weapons continues at regular assembly depots and at new ones established. Research (at Los Alamos and elsewhere) continued to be directed at improvement of current weapon models, and at development of new models to meet the requirements of the Armed Forces. It is expected that by this Summer the facility at Rocky Flats, near Denver, Colo., will be completed, and shakedown of those portions of the plant not currently in operation will commence. Construction of the USAEC's new plant near Macomb, Ill. (the Spoon River Plant) is scheduled to begin this month (August). It will be an explosives processing and assembly plant; no radioactive materials will be handled.

NUCLEAR REACTOR DEVELOPMENT: A greater number of significant events in reactor development occurred in this period than in any previous similar period since the USAEC was organized. One accomplishment was the successful operation at Oak Ridge National Laboratory of the homogeneous reactor experiment, with generation of about 150 kw. of useful electricity. Basic purpose in building this reactor was to determine whether a circulating fuel reactor would operate smoothly. Now, tests have shown that the reactor operates without large nuclear fluctuations. Of most importance, is that this particular reactor is an approach to nuclear power in which it is hoped that large economies may result from the use of liquid fuel, minimizing costs of fuel fabrication and chemical processing. Experimental operation continues, in an effort to solve many of the remaining chemical and design problems.

Naval Reactors: An event of importance occurred March 31st when the land-based prototype of the submarine thermal reactor at the national reactor testing station (Arco, Idaho) achieved criticality, i.e., the nuclear components of the reactor had begun to sustain a chain reaction. On May 31st, the reactor first generated substantial amounts of power. Further testing and operation are continuing as the plant gradually is being brought to full power. These experiments are to train the crew of the submarine Nautilus, and to determine the operating characteristics of the submarine's power plant.

THE UNITED STATES' ATOMIC ENERGY PROGRAM, January-July, 1953. (Cont'd).

NUCLEAR REACTOR DEVELOPMENT (Cont'd): At Knolls Atomic Power Laboratory, West Milton, N. Y., construction of the land-based prototype of the submarine intermediate reactor and its power plant continues. Prime contractor-operator at Knolls is General Electric Co., both on this particular project, and on other less advanced nuclear projects there. Now at Knolls is the first group of naval officers and enlisted men, to familiarize them with operation of the nuclear reactor and power plant. They are the nucleus of the crew that will man the submarine Sea Wolf, which will be powered by a submarine intermediate reactor.

In an attempt to develop an advanced nuclear power plant for a submarine of significantly higher speed than these first two nuclear-powered craft, Knolls and Argonne National Laboratory now have underway design work in this direction.

Aircraft Reactors: Some $5.5 million in construction contracts were awarded by the USAEC in March in connection with aircraft nuclear propulsion activities. The contracts involved work on administration, assembly, and maintenance areas for ground test facilities for aircraft reactors, at the national reactor testing station, Arco, Idaho. They also included other facilities at Oak Ridge National Laboratory. Meanwhile, the military requirements for an aircraft nuclear reactor have been modified, and the program has been recast to "develop the best possible nuclear power system". Design and development work continues at General Electric Company's aircraft gas turbine division, Evandale, Ohio, and at Oak Ridge National Laboratory, where work on alternate systems is being conducted. In June, Pratt & Whitney Aircraft Div., United Aircraft Corp., East Hartford, Conn., received a USAEC contract for aircraft nuclear propulsion development work.

RAW MATERIALS: Production of uranium from domestic ores showed substantial gains; the production included some byproduct uranium from treatment of phosphate rock by Blockson Chemical Co., at Joliet, Ill. Other plants for byproduct recovery of uranium from phosphate rock are nearing completion at Mulberry, Fla., where International Minerals & Chemical Corp., and Virginia-Carolina Chemical Corp., are establishing facilities for such extraction. Because of this increased activity in uranium recovery from phosphates, a small production office has been set up by the USAEC at Plant City, Fla., which is the center of the Florida phosphate mining industry.

To handle uranium ores of the Colorado Plateau, there are now eight ore-processing mills; construction of a new mill by Anaconda Copper Mining Co., near Grants, N. Mex., is nearing completion, with the plant expected to be in operation this Fall. In addition, new mills are planned by Kerr-McGee Oil Industries, Inc., ag Shiprock, N. M., and by Vanadium Corp. of America, at Hite, Utah.

These recovery plants, (uranium from phosphate rock, from Colorado Plateau ores, etc.) which obtain uranium from minerals not previously considered usable ores, result from research by the USAEC's raw materials development laboratory. American Cyanamid Co. is now operating the laboratory, as a prime contractor to the USAEC; since early this year it has been operating at a new location in Winchester, Mass. Other important contractors in this research program include Rohm & Haas Co., Philadelphia; Dow Chemical Co., at its Pittsburgh, Calif., laboratories; International Minerals & Chemical Corp., and U. S. Phosphoric Products, both in Florida; the Merrill Co., San Francisco; the Tennessee Valley Authority, at Muscle Shoals, Ala.; and Armour Fertilizer Works, Chicago, Ill.

Foreign sources continue as important suppliers to the USAEC. Ores from the Union Miniere du Haut-Katanga, whose sales agent in the U.S. is African Minerals, New York, were delivered to the USAEC at a steady rate. The Canadian-government-operated Eldorado Mining & Refining Co., Ltd., also supplied the USAEC.

Sincerely,

The Staff,
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